

## **REMARKS**

Claims 1, 8-12, 15 and 18-25 are pending.

Claims 1, 8-12, 15 and 18-25 stand rejected.

Claims 1 and 12 have been amended. Support for these amendments can be found throughout the specification and drawings, as originally filed.

### **35 USC §103(a) REJECTION**

Claims 1, 8-12, 15 and 18-25 stand rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 5,252,413 to Alamgir et al. in view of U.S. Patent No. 5,389,463 to Chang et al., and/or in view of U.S. Patent No. 6,617,078 to Chia et al.

The Applicants respectfully traverse the 35 U.S.C. §103(a) rejection of claims 1, 8-12, 15 and 18-25.

The standard for obviousness is that there must be some suggestion, either in the reference or in the relevant art, of how to modify what is disclosed to arrive at the claimed invention. In addition, "[s]omething in the prior art as a whole must suggest the desirability and, thus, the obviousness, of making" the modification to the art suggested by the Examiner. *Uniroyal, Inc. v. Rudkin-Wiley Corp.*, 837 F.2d 1044, 1051, 5 U.S.P.Q.2d (BNA) 1434, 1438 (Fed. Cir.), cert. denied, 488 U.S. 825 (1988). Although the Examiner may suggest the teachings of a primary reference could be modified to arrive at the claimed subject matter, the modification is not obvious unless the prior art also suggests the desirability of such modification. *In re Laskowski*, 871 F.2d 115, 117, 10 U.S.P.Q.2d (BNA) 1397, 1398 (Fed. Cir.1989). There must be a teaching in the prior art for the proposed combination or modification to be proper. *In re Newell*, 891 F.2d

899, 13 U.S.P.Q.2d (BNA) 1248 (Fed. Cir. 1989). If the prior art fails to provide this necessary teaching, suggestion, or incentive supporting the Examiner's suggested modification, the rejection based upon this suggested modification is error and must be reversed. *In re Bond*, 910 F.2d 831, 15 U.S.P.Q.2d (BNA) 1566 (Fed. Cir. 1990).

The law is also clear that a claim in dependent form shall be construed to incorporate all the limitations of the claim to which it refers. 35 U.S.C. 112, fourth paragraph.

In the interests of expediting prosecution of the instant application, and without admission that any amendment is required, the Applicants have amended claim 1 to recite, among other things, a polymer electrolyte comprising: (1) a modified chlorine containing polymer having an enhanced chlorine level relative to a chlorine content of an unmodified chlorine containing polymer formed from polymerization of its monomer; (2) a salt of an alkali metal; and (3) an aprotic solvent, wherein said polymer electrolyte is a solid polymer electrolyte comprising said salt and said aprotic solvent integrated with said modified chlorine containing polymer, wherein said modified chlorine containing polymer comprises unblended C-PVC, said C-PVC having 60-75 wt % chlorine, wherein said polymer electrolyte comprises 10-40 wt % of said C-PVC.

In the interests of expediting prosecution of the instant application, and without admission that any amendment is required, the Applicants have amended claim 12 to recite, among other things, a rechargeable battery, comprising: (1) an anode containing an alkali metal; (2) a cathode; and (3) a polymer electrolyte formed from a modified chlorine containing polymer having an enhanced chlorine level relative to a chlorine content of an unmodified chlorine containing polymer formed from polymerization of its monomer, a

salt of an alkali metal, and an aprotic solvent, wherein said polymer electrolyte is a solid polymer electrolyte comprising said salt and said aprotic solvent integrated with said modified chlorine containing polymer, wherein said modified chlorine containing polymer comprises unblended C-PVC, said C-PVC having 60-75 wt % chlorine, wherein said polymer electrolyte comprises 10-40 wt % of said C-PVC.

Neither Alamgir et al., Chang et al., and/or Chia et al., either alone or in combination therewith, suggests the invention as claimed in independent claims 1 and/or 12 or the claims dependent therefrom.

The Examiner correctly noted that Alamgir et al. is silent with respect to the solid organic polymer matrix (separator) of the solid polymer electrolyte containing chlorinated PVC or a chlorinated PVC having 60-72 (now recited as 75) wt% chlorine.

The recitation of Chang et al. or Chia et al. does not cure the deficiencies in the teachings of Alamgir et al.

Initially, there is no motivation or suggestion that substituting chlorinated PVC into the ***non-chlorinated*** formulations taught by Alamgir et al. would even be functional, let alone desirable. Additionally, as the Examiner noted, Chang et al. discloses that the chlorine present in the polymer is at least in the amount of 55 percent, and, as the Examiner noted, greater than 65 percent being preferred. Furthermore, as the Examiner noted, Chia et al. discloses that the bound chlorine present in the polymer is at least in the amount of 57 percent. Thus, both Chang et al. and Chia et al. teach polymers containing extremely high levels of chlorine, whereas, as the Examiner has acknowledged, Alamgir et al. is completely silent on the subject of using chlorinated PVC, despite the fact that conventional PVC is clearly disclosed.

Furthermore, Chia et al. specifically discloses that blends of chlorinated polymers are highly preferred over using chlorinated PVC alone, and thus teaches against the claimed invention. The Examiner's attention is drawn to column 3, lines 7-19, which states:

Preferably, the chlorinated PVC is blended with a terpolymer of vinylidene chloride. It showed enhanced high temperature stability and also displayed mechanical integrity in the as-cast and extracted separator films. If using vinylidene chloride terpolymer alone as the polymer binder, the as-cast separator shows good mechanical properties, but it becomes very brittle with poor [sic] handelability after the removal of plasticizer, a step used to produce porous membrane. ***Separately, if using chlorinated PVC alone as the polymer binder, the as-cast separator film appears to be tacky and hence limits its application. It is the blending of chlorinated PVC and terpolymer of vinylidene chloride, which provides the most desirable mechanical properties.*** (Emphasis added).

Additionally, Chang et al. also specifically discloses that chlorinated PVC can be blended with other chlorinated polymers, and thus teaches against the claimed invention. The Examiner's attention is drawn to column 5, lines 12-15, which states that ***“this polymer [chlorinated PVC] can be blended*** with lower chlorine content (from about 55% to 65%) and higher chlorine content (from about 65% to 70%) material.” (Emphasis added). Thus, at least theoretically, if enough of the “55% type” chlorinated polymer is used in the blend formulation, it would take the chlorinated polymer formulation disclosed by Chang et al. outside of the claimed range.

Thus, one of ordinary skill in the art would not look to Alamgir et al., Chang et al., and/or Chia et al., either alone or in combination therewith, for guidance on making a polymer electrolyte and/or rechargeable battery, as presently claimed.

Because claim 1 is allowable over Alamgir et al., Chang et al., and/or Chia et al., either alone or in combination therewith, for at least the reasons stated above, claims 8-

11, which depend from and further define claim 1, are likewise allowable. Because claim 12 is allowable over Alamgir et al., Chang et al., and/or Chia et al., either alone or in combination therewith, for at least the reasons stated above, claims 15 and 18-25, which depend from and further define claim 12, are likewise allowable.

Accordingly, the Applicants contend that the 35 U.S.C. 103(a) rejection of claims 1, 8-12, 15 and 18-25 has been overcome.

## **CONCLUSION**

In view of the foregoing, the Applicants respectfully request reconsideration and reexamination of the Application. The Applicants respectfully submit that each item raised by Examiner in the Office Action of August 4, 2006 has been successfully traversed, overcome or rendered moot by this response. The Applicants respectfully submit that each of the claims in this Application is in condition for allowance and such allowance is earnestly solicited.

The Examiner is invited to telephone the Applicants' undersigned attorney at (248) 723-0487 if any unresolved matters remain.

Any needed extension of time is hereby requested with the filing of this document.

The Commissioner is authorized to charge any additional fees or credit any overpayment to Deposit Account No. 08-2789.

**Respectfully submitted,**

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**Date**

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